

REMARKS

The above-referenced application has been reviewed in light of the Examiner's Office Action dated May 23, 2003. Claims 1-14 stand rejected. Claims 1, 5, 10 and 12-13 have been amended. Accordingly, Claims 1-14 are currently pending in this application. These amendments are supported by the specification as originally filed, and no new matter has been added. The Examiner's reconsideration of the rejections in view of the above amendments and the following remarks is respectfully requested.

In accordance with the Office Action, Claims 1, 2 and 5-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,852,487 to Fujimori et al. (the '487 patent or Fujimori) in view of U.S. Patent No. 6,339,462 B1 to Kishimoto et al (the '462 patent or Kishimoto). Applicants' respectfully traverse, and submit that amended Claims 1, 5, 10 and 12-13, and those depending therefrom, are not rendered obvious by Fujimori in view of Kishimoto for at least the reasons set forth below.

Applicants have amended Claims 1, 5, 10 and 12-13 to broaden the scope of patent protection while potentially clarifying the patentable features of the invention. Applicants' amended Claim 1 recites, *inter alia*, that "a cross-section of each spacer parallel to the plane of a substrate at said intermediate point is no larger in area than either of said first and second contact surfaces." Claim 1 has also been amended to set forth that contact between each spacer and its respective substrate occurs at a named contact surface. Thus, amended Claim 1 sets forth that the cross-sectional area at the contact point between the spacer members is no larger than the contact area between either spacer member and its respective substrate. Claims 5, 10 and 12-13 have been similarly amended.

The '487 patent to Fujimori et al. shows an LCD device with touch-sensor capability having a **single** grid-like spacer 11 (see FIG. 2 of Fujimori). The LCD device has a number of separate liquid crystal regions 12 (see FIG. 1 of Fujimori) defined by the grid-like spacer 11. Such devices may exhibit disadvantages such

as air pockets and/or increased labor requirements when injecting the separate regions with liquid crystal molecules.

Applicant's present disclosure, on the other hand, sets forth an LCD device with touch-sensor capability having a single contiguous liquid crystal region 18 (see FIG. 2 of Application). Thus, Applicants' **plurality** of gap controlling spacers 19 do not cause isolation of the liquid crystal molecules, and thereby promote complete filling of the liquid crystal layer during injection. In addition, Applicants' columnar gap controlling spacers may be arranged to compensate for design and/or usage considerations by disposing a greater number of spacers towards the center of the touch-pad, for example (see Application at p. 10, line 18 through p. 11, line 10), as set forth in dependent claims. Fujimori et al. neither teach nor suggest such features, and teach away from such dispositions of spacers by showing a single fixed grid-like spacer. Thus, the showings of Fujimori et al. are inapposite to Applicants' claimed feature of columnar spacers.

The '462 patent to Kishimoto et al. shows an LCD device without any provision for touch-sensor capability. Thus, Applicants' respectfully submit that the showings of Kishimoto et al. with respect to spacers for supporting the loads of touch-sensor usage would not be adopted by those of ordinary skill in the pertinent art for touch-sensor LCD devices. In addition, Kishimoto et al. show spacers having a reduced contact area at an upper surface, and teach that shapes having a 45 degree angle with respect to the lattice wall are desirable (see, e.g., col. 5, lines 28-36 of Kishimoto; FIG. 1, num. 20).

In contrast, Applicants' present disclosure recognizes the advantages of increased surface-contact area at each end of the spacer (see, e.g., p.7, l. 1-2 and l. 11-14; p. 9, l. 4-9; FIG. 12, 19a lower surface and 19b upper surface), and further recognizes the advantages of providing a necked-down interface between two spacer portions to enable the spacer to yield more in that region (see, e.g., p.

7, I. 9-11 and I. 20-21; FIG. 12, interface between 19a and 19b) rather than at the spacer to substrate layer interface.

In accordance with the Office Action, Claims 13-14 stand rejected under 35 U.S.C. §103(a) as being obvious over Japanese Patent No. JP 2000-227596 to Yanagawa et al. (“Yanagawa”) in view of in view of U.S. Patent No. 6,339,462 B1 to Kishimoto et al (the ‘462 patent or Kishimoto). Applicants’ respectfully submit that amended Claims 13-14 are not rendered obvious by Yanagawa in view of Kishimoto for at least the reasons set forth below.

As discussed above, the ‘462 patent to Kishimoto et al. shows an LCD device without any provision for touch-sensor capability. Thus, Applicants’ respectfully submit that the showings of Kishimoto et al. with respect to spacers for supporting the loads of touch-sensor usage would not be adopted by those of ordinary skill in the pertinent art for touch-sensor LCD devices. Yanagawa also fails to teach a touch-sensor LCD. Accordingly, the ‘462 patent to Kishimoto et al. fails to overcome this and other deficiencies of Japanese Patent No. JP 2000-227596 to Yanagawa et al.

Each of Claims 2-4, 6-9, 11 and 14 ultimately depends from an amended independent claim, and necessarily includes each of the elements and limitations thereof. In addition, none of the cited references either teaches or suggests a “touch sensor type liquid crystal display comprising ... a plurality of columnar gap controlling spacers, each of which restricts a width of the gap and a spacer movement in a planar direction, each of the spacers being formed by two members with one of the two members contacting the first substrate to define a first contact surface and the other of the two members contacting the second substrate to define a second contact surface and the two members contacting each other at a point intermediate between the first and second substrates, wherein a cross-section of each spacer parallel to the plane of a substrate at said intermediate point is no larger in area than either of said first and second contact surfaces,” as recited in amended independent Claim 1.

Therefore, each of Claims 1-14 is neither anticipated nor rendered obvious by the '487 patent to Fujimori et al., whether taken alone or in combination with any of the other references of record in this case.

Conclusion

Accordingly, it is respectfully submitted that independent Claims 1, 5, 10 and 12-13 are in condition for allowance for at least the reasons stated above. Since Claims 2-4, 6-9, 11 and 14 each depend from one of the above claims and necessarily include each of the elements and limitations thereof, it is respectfully submitted that these claims are also in condition for allowance for at least the reasons stated, and for reciting additional patentable subject matter. Thus, each of Claims 1-14 is in condition for allowance. All issues raised by the Examiner having been addressed, reconsideration of the rejections and an early and favorable allowance of this case is earnestly solicited.

Respectfully submitted,

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